

1

INTRODUCTION: WATERS OF THE WEBER RIVER BASIN

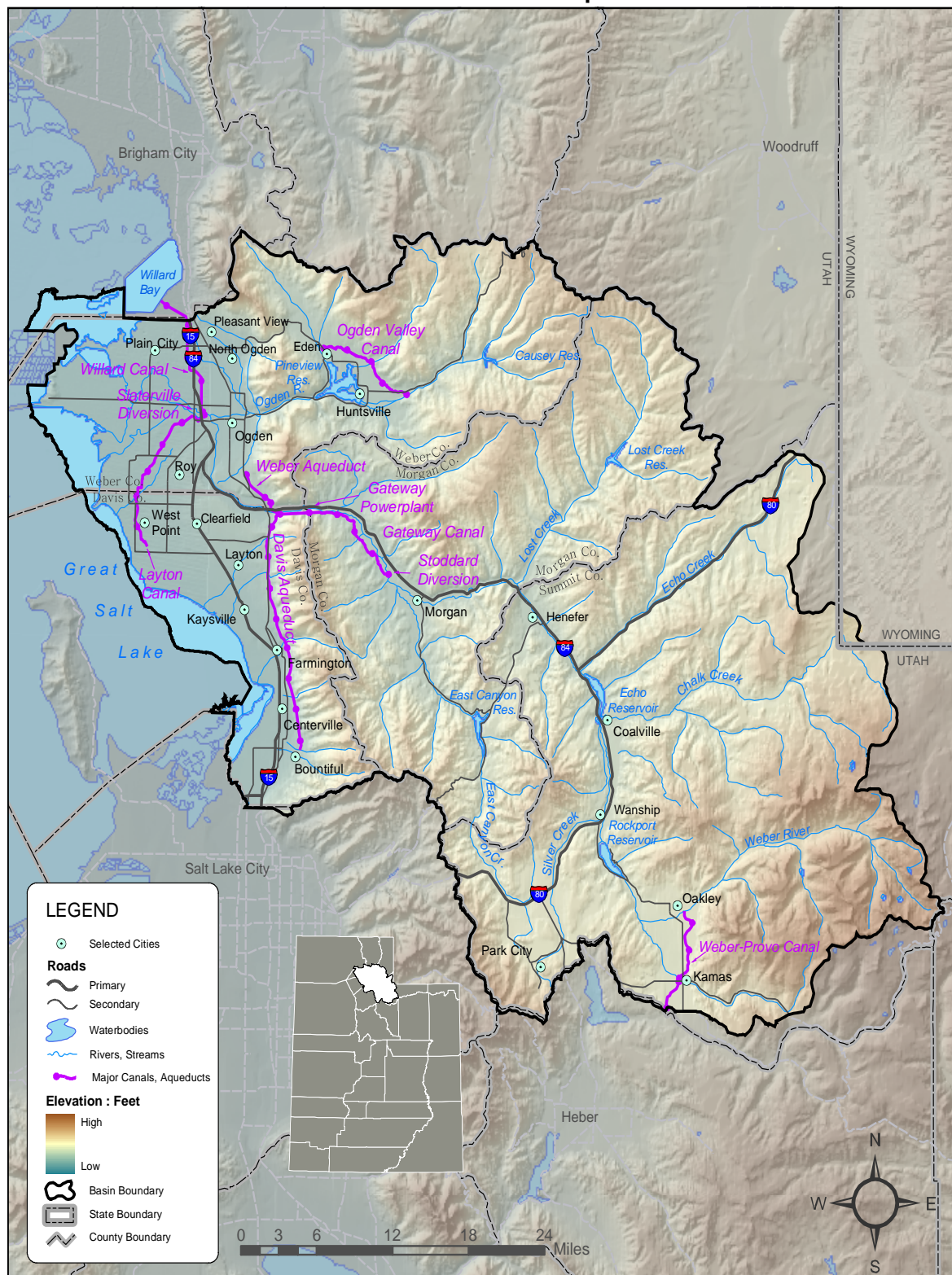
The Weber River Basin contains a major portion of the Wasatch Range and receives runoff from these mountains as well as the northwest slopes of the Uinta Mountains (see Figure 1). The basin is one of Utah's wettest basins, receiving an average of 27 inches of precipitation annually. This is more than any of Utah's ten other major river basins, and twice that of the statewide average of 13 inches. The water resources of the Weber River Basin are also considered to be among Utah's most highly developed. The combination of relatively high precipitation and advanced development has placed the Weber River Basin in a good position to meet anticipated growth. However, this does not mean that current conditions within the basin are without problems or that accommodating future growth will come without difficulty.

Several streams and water bodies in the Weber River Basin currently do not meet Utah's water quality standards and are in danger of further degradation if trends continue. In addition to these problems, environmental and recreational demands are increasing. This competition will continue and will require increased emphasis on wise management and efficient use of the basin's water resources.

Keys to assuring a productive future for the water resources of the Weber River Basin include the following:

- Strong cooperation between all water resources stakeholders;
- Concerted effort to conserve water in the municipal and industrial sector;
- Judicious conversion of agricultural water to meet municipal and industrial needs as irrigated farm land becomes urban;
- Careful application of innovative water management strategies such as aquifer storage and recovery, water reuse, and cooperative agreements;
- Continued investment in infrastructure and carefully planned water developments;

FIGURE 1
Weber River Basin Map



- Sufficient funding for water quality programs; and
- Careful consideration of environmental, recreational and other needs.

PURPOSE OF THIS DOCUMENT

The purpose of this document is to describe the current status of the water resources in the Weber River Basin and estimate the future demands that will be placed upon them. This involves quantifying the available water supply, estimating current and future uses, and identifying ways to manage existing supplies and obtain new ones to satisfy future needs. A main goal of this document is to help water managers, planners and others formulate the management strategies and policies that will ensure a bright future for waters in the Weber River Basin. In addition to presenting basic water data, this document should also be a valuable resource for those who live in the Weber Basin or who are otherwise interested in contributing to water-related decisions.

THE SIGNIFICANCE OF WATER RESOURCES

Water is a central feature of the Weber River Basin's landscapes. Originating high in the mountains from snowfields and lakes, the Weber River, Ogden River and other tributaries have carved out many beautiful canyons, depositing rich soil in numerous mountain valleys. The Weber and Ogden rivers eventually make their way through the Wasatch Range to the lowlands of the Great Basin and its terminus the Great Salt Lake—North America's largest inland sea. Native inhabitants of the Weber River Basin depended upon water resources and associated habitat and wildlife to sustain their way of life. They often spent the summers in the upper valleys where wildlife was abundant and returned to the low-lying areas for winter. Later, with the arrival of white settlers, the waters of the basin were increasingly utilized.

In 1869 the railroad made its way through the heart of the basin, bringing with it increased commerce and population. As a result, Ogden, a main hub of the railroad, grew and expanded its role as one of Utah's major cities. Located at the foot of the Wasatch Mountains, near the spot where the Ogden and Weber Rivers meet, Ogden is currently the sixth largest city in Utah and near the northern extreme of the Wasatch Front—Utah's most densely populated region.

The close proximity of the Weber River Basin to the main population and commerce core of the Salt Lake Valley and diverse outdoor activities have contributed to the basin's rapid growth. For these and other reasons, the basin is expected to experience substantial population growth in the future—a future in which water resources will continue to play a vital role.

HISTORY OF WATER PLANNING AND DEVELOPMENT

The Pioneer Period (1847-1880)

The first irrigation by Anglo-Saxons in Utah occurred in 1845 at Fort Buenaventura, near present-day Ogden. Miles Goodyear—a trapper by trade—built the fort as an emigrant waystation. Settlers at the fort carried water from the nearby Weber River in buckets to water a small garden.¹ However, it was not until after the Mormon pioneers purchased the fort from Mr. Goodyear in 1847 that significant irrigation in the basin began.

Early Mormon settlement occurred near the mouths of streams flowing from the Wasatch Range toward the Great Salt Lake. By the early 1850s, small communities sprang up next to nearly every stream with sufficient flow to sustain irrigation. Later, as the pioneers became more familiar with the practice of irrigation (through trial-and-error), communities combined their resources to dig canals and ditches to water distant plots of land. During the mid-1850s, settlement and diversion of upper basin streams and tributaries began in earnest.

Following the ambitious vision of Brigham Young to engage cooperatively in water development projects,² early settlers developed a model of irrigation that changed the face of the West. Irrigation became such an integral part of the communities within the entire basin that by 1860 the flow in many streams had become over-appropriated. Disputes over water rights were common as the fields of downstream settlements dried-up and crops failed.

The pioneers recognized early that there was plenty of water available to sustain year-long crops. However, since most of the water ran down the canyons and past irrigated fields in the spring and early summer, many crops failed. In 1852, Elias Adams and his sons countered this problem for their farm by building a reservoir on Holmes Creek, near present-day Layton. Although only four feet high and 70 feet long, it is believed that this structure was the first irrigation storage reservoir constructed in western America. The community recognized Adams' wisdom and by 1863 pooled their resources together to raise the dam to 15 feet.³

Nearly every community within the basin shares a similar story to that of Elias Adams and his neighbors. Brought together by common beliefs and the need to make a living from the arid soil, settlers worked shoulder-to-shoulder and contributed whatever they could for the welfare of the entire community. More often than not, shares of irrigation water were allotted to individuals according to the amount of labor and materials they provided to a project. Thus, each family acquired the water they needed for their own farm while assuring that everyone received their share.

An Era of Secularization (1880-1935)

Although the communal model of water development that the Mormon pioneers used worked well for many decades, the growing size and diversity of Utah's population created a movement away from this model to a more secular method. In 1880, the territorial government passed a new water law. Under this law "it was no longer the duty of the territory to enforce a beneficial and economical use of the public waters but merely to supply a means of adjudicating the difficulties which may arise."⁴ The law also officially removed the understanding that water rights had to remain with the land and allowed their owners to use and dispose of them as personal property.

The 1880 law initially led to a few water projects and transactions of a speculative nature that ended in failure. This included the Bear River Canal project that would have brought water from the Bear River as far

south as Ogden. Originally surveyed in 1868, this project did not begin construction until it got a boost from investors in 1883. Although portions of the project were built, the project never completely materialized and only delivered water as far south as the Hammond Canal (south of Deweyville). As part of this project, the Bear River Irrigation and Ogden Water Works Company purchased the Ogden City Water Works with the intention of selling water rights. Although this speculation never progressed to a point where it harmed the citizens of Ogden, it was not until 1910 that a newly elected city government bonded for \$100,000 to repurchase the water works, and restore public control.⁵

Although the Utah Legislature passed several laws from 1897-1919 that restored public control of the state's water, the communal model established by the pioneers was never fully restored. Highly influenced by the experiences of other western states and the federal National Reclamation Act of 1902, Utah's new water laws paved the way for the adjudication of water rights claims, a pre-requisite to the construction of large water development projects through the federal reclamation program.

While the Bureau of Reclamation's Weber Basin Project had to wait until after the adjudication of the Weber River was completed in 1937, several other locally-led projects became a reality during this era. These included the Weber and Davis Canal, East Canyon Dam, Pioneer Electric Power Plant, Bonneville Canal, Echo Dam, and Pineview Dam. The completion of the Weber and Davis Canal, and the storage of water to keep it full (in East Canyon Reservoir), marked the partial fulfillment of the proposal Brigham Young made in 1856 to build a canal that would bring water from the Weber River to Bountiful.⁶

The Modern Age (1936-Present)

Prior to and during World War II, the Weber River Basin experienced rapid growth. Much of this growth occurred as the result of large investments in military infrastructure.⁷ In 1936, the U.S. Army activated its arsenal at Sunset; in 1939, construction at Hill Air Field began; and in 1940, the Army established a supply

depot near Ogden. Although water for these installations and the population they brought was easily obtained, this growth prompted local leaders to become more concerned about water development.

During the mid-1940s, local leaders began a concerted grassroots effort to promote water development. Strong support for such development came from the agricultural community. Weber and Davis counties had long been one of the state's most productive agricultural regions, and farmers there were enticed by the prospect of bringing more land under production as well as increasing the productivity of existing land. This effort, along with the earlier completion of the Weber River adjudication in 1937, prompted the U.S. Bureau of Reclamation to begin substantial investigations.

In 1951, the Bureau of Reclamation brought forward an ambitious water development proposal—the Weber Basin Project. With the support of federal funds, the proposed project would capture much of the remaining surface water supply of the Weber River, mainly excess spring runoff, allowing the river to be more fully utilized. In order for this project to proceed, the Weber Basin Water Conservancy District was created to pay back the federal obligations and to operate and maintain project facilities. Completed in the late 1960s, the Weber Basin Project was the last major water development project within the basin. The water supply provided by this project has allowed growth within the basin to continue to the present day and has yet to be fully utilized.

STATE WATER PLANNING: FULFILLING A STEWARDSHIP

One of the main responsibilities of the Division of Water Resources is to conduct comprehensive water planning in Utah. Over the past several decades, the division has conducted numerous studies and prepared many reports for the Weber River Basin. A landmark document resulting from these studies was the *Weber River Basin Plan*, published in 1997.

1997 Weber River Basin Plan

Although this document, *Weber River Basin—Planning for the Future*, touches upon many of the same topics presented in the 1997 *Weber River Basin Plan*, there is a valuable collection of pertinent data and useful information contained in the original plan that will not be revisited here. Some of the topics that will not be repeated, but may be valuable to the reader, are listed below:

- *Section 3.3 – Basin Description.* A detailed description of the basin's drainage area, topography, climate, physiography and geology.
- *Section 7 – Regulation/Institutional Considerations.* A discussion of water-related laws and regulations and the responsibilities of various state and federal agencies with regard to these laws.
- *Section 8 – Water Funding Programs.* A description of state and federal water funding programs.
- *Section 11.3 – Organizations and Regulations.* A discussion of local, state and federal agencies as well as the various laws that regulate drinking water.
- *Section 13 – Disaster and Emergency Response.* A description of the various types of disasters and emergencies that could disrupt the supply of water and the organizations and regulations that deal with them.
- *Section 16 – Federal Water Planning and Development.* A list of all the federal agencies involved directly or indirectly with water planning and development within the basin and description of their respective responsibilities.
- *Section 19.2 – Subsurface Geology and Aquifer Characteristics.* A geologic description of the major ground water areas within the basin.

A copy of the entire 1997 *Weber River Basin Plan* can be obtained by contacting the Division of Water Resources, or online at the division's web site: www.water.utah.gov.

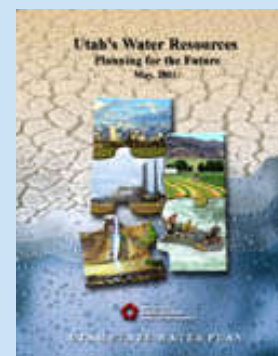
The 2001 Utah State Water Plan

In May of 2001, the Division of Water Resources updated the Utah State Water Plan with the publication of *Utah's Water Resources—Planning for the Future*. This plan addressed a host of issues important to Utah's future (see sidebar). While the Utah State

2001 Utah State Water Plan: Utah's Water Resources—Planning for the Future

Managing water resources in Utah is not an easy task. Supply is limited and competition between various uses continues to intensify. Add to that the cyclical nature of wet vs. dry periods, and one gets an inkling of the complex challenges facing Utah's water planners and managers.

Utah's Water Resources—Planning for the Future attempts to bring all the issues to light and to put the many pieces together that are required to obtain balanced and efficient water management. It discusses the major issues facing Utah's water resources and provides valuable data and guidance that will help in the important effort to efficiently manage one of the state's most precious resources.



Water Plan is a valuable guide to water planners, managers and others interested in contributing to water-related decisions throughout the state, it does not address in detail the specific needs of the state's various river basins.

The Current Plan

This document, *Weber River Basin—Planning for the Future*, is modeled after the 2001 State Water Plan and provides the reader with more detail and perspective concerning issues of importance to the Weber River Basin. It takes a fresh new look at the water resources of the Weber River Basin. With increasing water demands caused by rapid population growth, water is becoming a more precious commodity. The waters of the Weber River Basin will play an important role in meeting some of Utah's future needs, and protecting the quality of this water and its ability to sustain the increased population is of utmost concern. The Division of Water Resources hopes that this plan establishes a strong framework that will help guide and influence water-related decisions within the basin.

NOTES

¹ Sadler, Richard W. and Richard C. Roberts, *The Weber River Basin: Grass Roots Democracy and Water Development* (Logan, Utah: Utah State University Press, 1994), 27. This 283-page book presents a comprehensive history of water development in the Weber River Basin.

² Pratt, Orson, ed., *Journal of Discourses*, vol. 3 (Liverpool: Orson Pratt, 1856), 339-40. Following an inspection of a canal being built in the Salt Lake Valley, Brigham Young made the following statements at the Bowery in Salt Lake City on June 8, 1856 (portions in bold type concern the Weber River):

Shall we stop making canals, when the one now in progress is finished? No, for as soon as that is completed from Big Cottonwood to this city, we expect to make a canal on the west side of Jordan, and take its water along the east base of the west mountains, as there is more farming land on the west side of that river than on the east. When that work is accomplished we shall continue our exertions, until Provo River runs to this city. We intend to bring it around the point of the mountain to Little Cottonwood, from that to Big Cottonwood, and lead its waters upon all the land from Provo Canyon to this city, for there is more water runs in that stream alone than would be needed for that purpose.

If we had time we should build several reservoirs to save the waters of City Creek, each one to contain enough for once irrigating one-third of the city. If we had such reservoirs the whole of this city might be irrigated with water that now runs to waste. Even then we do not intend to cease our improvements, for **we expect that part of the Weber will be brought to the Hot Springs [near Bountiful], there to meet the waters from the south and empty into Jordan.** Then we contemplate that Bear River will be taken out at the gates to irrigate a rich

and extensive region on its left bank, and also upon the other side to meet the waters of the Malad. We know not the end of our public labors and enterprises in this Territory, and we design performing them as fast as we can.

³ Sadler, Richard W. and Richard C. Roberts, 64. Elias Adams' history-making dam eventually reached a final height of 70 feet in 1930.

⁴ Thomas, George, *The Development of Institutions under Irrigation with Special Reference to Early Utah Conditions* (New York: Macmillan Co., 1920), 138-139.

⁵ Sadler, Richard W. and Richard C. Roberts, 107-109.

⁶ See Note 2.

⁷ Sadler, Richard W. and Richard C. Roberts, 139.